METHOD AND APPARATUS FOR DETERMINING AND PRESENTING OUTCOMES AT A GAMING DEVICE

The present utility patent application claims the benefit of priority of the following U.S. Provisional Patent Applications:

Serial Number 60/451,973, entitled METHOD AND APPARATUS FOR MANAGING GAME CONFIRMATIONS, filed March 4, 2003; and

Serial Number 60/452,166, entitled SYSTEM AND METHOD FOR DETERMINING AND PRESENTING OUTCOMES AT A GAMING DEVICE, filed March 4, 2003.

Each of the above applications are incorporated by reference herein.

BACKGROUND INFORMATION

Gaming devices (*e.g.*, reeled slot machines or video poker machines) generate more than $15 billion per year in revenue for casinos in the United States alone. This figure accounts for more than half of the gaming revenue for a typical United States casino. The situation is similar in other countries in which gaming devices are popular, such as Europe and Australia. Accordingly, casino operators are interested in increasing the enjoyment of playing a slot machine in order to maintain or increase this level of revenue.

Thus, it would be advantageous to encourage play at gaming devices.

BRIEF DESCRIPTION OF THE DRAWINGS

Fig. 1 is a block diagram of a network according to an embodiment of the invention.

Fig. 2 is a block diagram of a gaming device according to an embodiment of the invention.

Fig. 3 is a block diagram of reels of a slot machine according to an embodiment of the invention.

DETAILED DESCRIPTION

Numerous embodiments are described in this application, and are presented for illustrative purposes only. The described embodiments are not intended to be limiting in any sense. The invention is widely applicable to numerous embodiments, as is readily apparent from the disclosure herein.

While the methods and apparatus of the present invention are described herein by way of particular embodiments, those skilled in the art will recognize that the present invention may be practiced with modification and alteration without departing from the teachings disclosed herein. Although particular features of the present invention may be described with reference to one or more particular embodiments or figures, it should be understood that such features are not limited to usage in the one or more particular embodiments or figures with reference to which they are described.

The terms "an embodiment", "embodiment", "embodiments", "the embodiment", "the embodiments" "one or more embodiments", "some embodiments", and "one embodiment" mean "one or more embodiments" unless expressly specified otherwise.

Further, although process steps, method steps, algorithms or the like may be described in a sequential order, such processes, methods and algorithms may be configured to work in alternate orders. In other words, any sequence or order of steps that may be described does not necessarily indicate a requirement that the steps be performed in that order.

It will be readily apparent that the various methods and algorithms described herein may be implemented by, e.g., appropriately programmed general purpose computers and computing devices. Further, programs which implement such methods and algorithms may be stored and transmitted in a variety of known media.

The steps of processes described herein may be performed in any order practical. Further, some steps may be performed simultaneously.

The following definitions are used herein unless otherwise indicated.

Basic Game: A game associated with a handle pull. *C.f.* meta-game.

Bonus Payout: A payout awarded in a meta-game. *C.f.* payout.

Controller: An electronic device (e.g., a computer) that communicates with one or more gaming devices. In a manner well known in the art, the controller may function as a computer server and may control the actions of gaming devices. The controller may also contain databases to record statistics such as coin-in, coin-out, jackpot information, theoretical wins, etc.

Display Matrix: A visual display area of an output device operatively connected to a gaming device that is designated to represent the accumulation of at least two game elements such as symbols, icons, and/or outcomes. In some embodiments, a display matrix includes at least two sub-areas, "cells", slots, or other subdivisions that can be populated by accumulated game elements. Further, in some embodiments, the relative position of accumulated game elements within a display matrix may qualify a player for a payout or bonus payout.

Game: A wagering activity whereby a player posts consideration, usually monetary in form, in exchange for a chance at winning a payout. The definition includes basic games and meta-games.

Game Device, Gaming Device: Any electrical, mechanical, or electro-mechanical device that, in a manner well known in the art, accepts wagers, steps through a process to determine an outcome, and pays winnings based on the outcome. The outcome may be randomly generated, as with a slot machine; may be generated through a combination of randomness and player skill, as with video poker; or may be generated entirely through player skill. Gaming devices may include slot machines (both video and mechanical reels), video poker machines, video blackjack machines, video roulette machines, video keno machines, video bingo machines, pachinko machines, video lottery terminals, handheld gaming devices, and the like.

Game Session, Gaming Session, Session: A gambling event with a beginning and end that may encompass a number of spins or span of time. The end of the game may be determined voluntarily (in which the player elects to stop play) or involuntarily (in which the gaming device terminates play). A game session is typically correlated with a meta-game, such that a meta-game is resolved upon completion of a game session.

Handle Pull, Pull, Spin, Discrete Game Play: A single play at a gaming device that generates a single outcome, whether or not a handle is involved in the play and whether or not a handle is even included in the gaming device. The definition is intended to be flexible in that a single play might constitute a single complete game, or a single wager. Handle pulls are generally associated with discrete outcomes that may yield individual payouts.

Meta-Game: A game associated with a game session, as opposed to a specific, isolated handle pull. Meta-games typically involve the aggregation of collected symbols. *C.f.* basic game.

Outcomes: The results of gaming events that may be used in determining payout or bonus payout eligibility. Outcomes may be associated with (i) individual symbols that independently can be used to determine payout eligibility (e.g. a single cherry symbol outcome yields a payout), and/or (ii) a combination of individual symbols that are used to determine payout or bonus payout eligibility (e.g. a cherry-cherry-cherry outcome in a basic slot machine game, or the aggregation of 3 cherries in a meta-game). Other example outcomes include a push in blackjack and a flush in video poker. Different types of gaming devices may have widely varying types of outcomes. Several are described in detail herein and still others will be apparent to those of skill in the art based on the present disclosure.

Payout: The prize, reward or winnings associated with a certain outcome in a basic game. *C.f.* bonus payout.

Player Tracking Card: Most casinos issue plastic or paper cards (resembling frequent shopper cards) to players as a way of identifying the player at a slot machine or table game. As is well known in the art, such cards typically have encoded thereon (in machine-readable and / or human readable form) a player identifier (e.g., a six digit number) which uniquely identifies the player (e.g., because the number is associated with a record in a database that includes corresponding player information). At a slot machine, the player inserts the card into a reader device and the player identifier is read from the card, most often magnetically. From the player identifier which the reader device reads, the corresponding player information may in turn be read from the database, typically via a network connection between the reader device and a device hosting the database.

Prepaid Session: Time or handle pulls that are paid for in advance. Once a session is prepaid, the player does not need to supply any additional funds until the session has been completed. A prepaid session may allow the player to complete many games during the session.

The disclosed embodiments can make games more entertaining for players and even prolong game play.

In one embodiment, an outcome is randomly determined and a random position at which to display the outcome in a display matrix is determined as well. For example, a game with a popcorn-theme is contemplated. A popcorn icon is communicated to the player (e.g., displayed via a display device). An outcome is randomly determined in a known manner, and a determination is made as to whether the outcome qualifies the player for a payout. The popcorn icon incorporates a symbol representing the outcome, (e.g., a cherry symbol), or is visually replaced by or transformed into a symbol (e.g., a cherry symbol). The gaming device and/or controller then randomly determines where in a display matrix to place the symbol. Once a position is determined for the symbol, the symbol may be visually transferred to the determined position in the display matrix (e.g., along a path from a starting position to the determined position). For

example, if a popcorn icon is transformed into a cherry symbol, the cherry symbol may then be moved visually to the determined area on a game display. Thus, as subsequent outcomes are similarly determined and placed, the combination of the accumulated outcomes may be used to determine a player's eligibility for a bonus payout. For example, if three cherries are collected in the same row of a display matrix, a bonus payout may result.

In one embodiment, an outcome is determined randomly, and a determination is made based on stored rules as to where to display the outcome in a display matrix with reference to a previously displayed outcome. In an example of such an embodiment, a popcorn-themed game is contemplated in which a popcorn icon is communicated to a player via a display device. An outcome is randomly determined and a determination is made as to whether the outcome qualifies the player for a payout. The popcorn icon incorporates a symbol representing the outcome, such as a cherry symbol, or is visually replaced by or transformed into a symbol. The gaming device and/or controller then determines where in a display matrix to place the symbol based on stored rules that consider the position of at least one previously placed symbol in the display matrix. For example, stored rules may dictate that: (1) subsequently generated symbols cannot replace previously generated symbols in a display matrix, and (2) unless occupied by other previously generated symbols, symbols should be placed in the row position closest to similar, previously-generated symbols in the display matrix (e.g. cherry symbols should be placed as close as possible to other cherry symbols, and in the same row of the matrix). Once a visual position is determined for the symbol, the symbol is visually transferred to the determined position in the display matrix. For example, once a popcorn icon is transformed into a cherry symbol, the cherry symbol is then visually moved to the determined area on a game display. Thus, the combined effect of the accumulated outcomes may be used to determine a player's eligibility for a bonus payout. For example, if three cherries are collected in the same row of a display matrix, a bonus payout may result.

In one embodiment, an outcome is determined randomly. Prior to the presentation of the outcome to the player, the outcome is divided into components. The components are, in turn, presented to the player in a display process that

shows the formation of the components into the outcome. Thus, in such an embodiment, the relative position of certain game symbols may be resolved by one determination, rather than by discrete positioning determinations for each symbol.

In an example of such an embodiment, an outcome such as "cherry-bar-plum" is determined from the results of a random number generator. The outcome may then be divided into components comprising one cherry symbol, one bar symbol and one plum symbol. The three symbols may then be communicated to the player in a manner that conceals the previously-determined relative positions of the individual component outcomes. For example, a first popcorn icon may be communicated to the player via a display device (e.g., a second display device separate from a display device where, e.g., reel symbols are typically generated). The first popcorn icon may then be visually replaced by, transformed into or otherwise communicated along with a symbol representing one of the three components of the outcome, such as the bar symbol. The bar symbol would then visually move to an area on the game display which represents the middle (or second) position in the three part outcome. Then, a second popcorn icon may be communicated to the player via a game screen. The second popcorn icon may then be visually replaced by, transformed into or otherwise communicated along with a symbol representing one of the two remaining outcomes (i.e. cherry or plum). A resulting cherry symbol would then visually move to an area on the game display that represents the first position in the three-part outcome. A third popcorn icon would then reveal or accompany the remaining plum symbol and be placed in the third position in the three-part outcome. Thus, in the third embodiment, although an outcome comprised of several symbols is determined initially, the outcome is slowly made apparent to the player as it is visually revealed from the individual components. Such an embodiment would, among other things, function to increase the anticipation felt by players as they await the resolution of an outcome.

Referring to FIG. 1, various embodiments of the invention may be configured to work in a network environment 100 which includes a computer 110 (*e.g.*, a slot server of a casino) that is in communication, via a communications network 120, with one or more gaming devices 130 (*e.g.*, slot machines, video poker machines) in a manner known in the art. The computer may communicate

with the gaming devices directly or indirectly, via a wired or wireless medium such as the Internet, LAN, WAN or Ethernet, Token Ring, or via any appropriate communications means or combination of communications means. Each of the gaming devices may comprise computers, such as those based on the Intel® Pentium® processor, that are adapted to communicate with the computer. Any number and type of devices may be in communication with the computer.

Communication between the devices and the computer, and among the devices, may be direct or indirect, such as over the Internet through a Web site maintained by computer on a remote server or over an on-line data network including commercial on-line service providers, bulletin board systems and the like. In yet other embodiments, the devices may communicate with one another and / or the computer over RF, cable TV, satellite links and the like.

Some, but not all, possible communication networks that may comprise the network or be otherwise part of the system include: a local area network (LAN), a wide area network (WAN), the Internet, a telephone line, a cable line, a radio channel, an optical communications line, and a satellite communications link. Possible communications protocols that may be part of the system include: Ethernet (or IEEE 802.3), SAP, ATP, Bluetooth™, and TCP/IP. Communication may be encrypted to ensure privacy and prevent fraud in any of a variety of ways well known in the art.

Those skilled in the art will understand that devices in communication with each other need not be continually transmitting to each other. On the contrary, such devices need only transmit to each other as necessary, and may actually refrain from exchanging data most of the time. For example, a device in communication with another device via the Internet may not transmit data to the other device for weeks at a time.

In an embodiment, a server computer may not be necessary and / or preferred. For example, the present invention may, in one or more embodiments, be practiced on a stand-alone gaming device and / or a gaming device in communication only with one or more other gaming devices. In such an embodiment, any functions described as performed by the computer or data described as stored on the computer may instead be performed by or stored on one or more gaming devices.

As is known in the art, a gaming device may be implemented as a system controller, a dedicated hardware circuit, an appropriately programmed general-purpose computer, or any other equivalent electronic, mechanical or electro-mechanical device. The gaming device may comprise, for example, a slot machine, a video poker machine, a video blackjack machine, a video keno machine, a video lottery machine, a pachinko machine or a table-top game. In various embodiments, a gaming device may comprise, for example, a personal computer (*e.g.*, which communicates with an online casino Web site), a telephone (*e.g.*, to communicate with an automated sports book that provides gaming services), or a portable handheld gaming device (*e.g.*, a PDA or Nintendo GameBoy). The gaming device may comprise any or all of the gaming devices of the aforementioned systems. In some embodiments, a user device such as a PDA or cell phone may be used in place of, or in addition to, some or all of the gaming device components. Further, a gaming device may comprise a personal computer or other device operable to communicate with an online casino and facilitate game play at the online casino. In one or more embodiments, the gaming device may comprise a computing device operable to execute software that simulates play of a reeled slot machine game, video poker game, video blackjack game, video keno game, video roulette game, or lottery game.

Referring to FIG. 2, a gaming device 200 comprises a processor 210, such as one or more Intel® Pentium® processors. The processor is operable to communicate with a random number generator, which may be a component of the gaming device. The processor may instead include a random number generator (e.g., hardware or software). The random number generator, in accordance with at least one embodiment of the present invention, may generate data representing random or pseudo-random values (referred to as "random numbers" herein). The random number generator may generate a random number, for example, every predetermined unit of time (*e.g.*, every thousandth of a second) or in response to an initiation of a game on the gaming device. In the former embodiment, the generated random numbers may be used as they are generated (*e.g.*, the random number generated at substantially the time of game initiation is used for that game) and / or stored for future use. A random number generated by the random number

generator may be used by the processor to determine, for example, at least one of an outcome and payout. A random number generator, as used herein, may be embodied as a processor separate from but working in cooperation with the processor. Alternatively, the random number generator may be embodied as an algorithm, program component, or software stored in the memory of the gaming device and used to generate a random number.

Although the generation or obtainment of a random number may in some embodiments be described as involving a random number generator of a gaming device, other methods of determining a random number may be employed. For example, a gaming device owner or operator may obtain sets of random numbers that have been generated by another entity. HotBits™, for example, is a service that provides random numbers that have been generated by timing successive pairs of radioactive decays detected by a Geiger-Muller tube interfaced to a computer. A blower mechanism that uses physical balls with numbers thereon may be used to determine a random number by randomly selecting one of the balls and determining the number thereof.

The processor may also be operable to communicate with a benefit output device, which may be a component of the gaming device. The benefit output device may comprise one or more devices for outputting a benefit to a player of the gaming device. For example, in one embodiment the gaming device may provide coins and / or tokens as a benefit. In such an embodiment the benefit output device may comprise a hopper 220 and hopper controller, for dispensing coins and / or tokens into a coin tray of the gaming device in a known manner. In another example, the gaming device may provide a receipt or other document on which there is printed an indication of a benefit (*e.g.*, a cashless gaming receipt that has printed thereon a monetary value, which is redeemable for cash in the amount of the monetary value). In such an embodiment the benefit output device may comprise a printing and document dispensing mechanism, as is known in the art. In yet another example, the gaming device may provide electronic credits as a benefit (which, *e.g.*, may be subsequently converted to coins and / or tokens and dispensed from a hopper into a coin tray). In such an embodiment the benefit output device may comprise a credit meter balance and / or a processor that

manages the amount of electronic credits that is indicated on a display of a credit meter balance. In yet another example, the gaming device may credit a monetary amount to a financial account associated with a player as a benefit provided to a player. The financial account may be, for example, a credit card account, a debit account, a charge account, a checking account, or a casino account. In such an embodiment the benefit output device may comprise a device for communicating with a server on which the financial account is maintained and / or a card reader 230.

The gaming device may include more than one benefit output device. For example, the gaming device may include both a hopper and hopper controller combination and a credit meter balance display. Such a gaming device may be operable to provide more than one type of benefit to a player of the gaming device. A single benefit output device may be operable to output more than one type of benefit. For example, a benefit output device may be operable to increase the balance of credits in a credit meter and communicate with a remote device in order to increase the balance of a financial account associated with a player.

The processor is also operable to communicate with a display device 240, which may be a component of gaming device. The display device may comprise, for example, one or more display screens or areas for outputting information related to game play on the gaming device, such as a cathode ray tube (CRT) monitor, liquid crystal display (LCD) screen, or light emitting diode (LED) screen. In one or more embodiments, a gaming device may comprise more than one display device. For example, a gaming device may comprise an LCD display for displaying electronic reels and a display area that displays rotating mechanical reels.

The processor may also be in communication with one or more other devices besides the display device, for outputting information (*e.g.*, to a player or another device). Such other one or more output devices may also be components of a gaming device. Such other one or more output devices may comprise, for example, an audio speaker (*e.g.*, for outputting an outcome or information related thereto, in addition to or in lieu of such information being output via a display device), an infra-red transmitter, a radio transmitter, an electric motor, a printer

(*e.g.*, such as for printing cashless gaming vouchers), a coupon or product dispenser, an infra-red port (e.g., for communicating with a second gaming device or a portable device of a player), a Braille computer monitor, and a coin or bill dispenser. For gaming devices, common output devices include a cathode ray tube (CRT) monitor on a video poker machine, a bell on a gaming device (*e.g.*, rings when a player wins), an LED display of a player's credit balance on a gaming device, an LCD display of a personal digital assistant (PDA) for displaying keno numbers.

The display device may comprise, for example, one or more display areas. For example, one of the display areas (e.g. a primary game screen) may display outcomes of games played on the gaming device (*e.g.*, electronic reels of a gaming device). Another of the display areas (e.g. a secondary game screen) may display rules for playing a game of the gaming device. Yet another of the display areas may display the benefits obtainable by playing a game of the gaming device (*e.g.*, in the form of a payout table). In one or more embodiments, the gaming device may include more than one display device, one or more other output devices, or a combination thereof (*e.g.*, two display devices and two audio speakers).

The processor may also be in communication with an input device 250, which is a device that is capable of receiving an input (*e.g.*, from a player or another device) and which may be a component of gaming device. An input device may communicate with or be part of another device (*e.g.* a server, a gaming device, etc.). Some examples of input devices include: a bar-code scanner, a magnetic stripe reader, a computer keyboard or keypad, a button, a handle, a keypad, a touch-screen, a microphone, an infrared sensor, a voice recognition module, a coin or bill acceptor, a sonic ranger, a computer port, a video camera, a motion detector, a digital camera, a network card, a universal serial bus (USB) port, a GPS receiver, a radio frequency identification (RFID) receiver, an RF receiver, a thermometer, a pressure sensor, an infrared port (e.g., for receiving communications from a second gaming device or from a another device such as a smart card or PDA of a player), and a weight scale. For gaming devices, common input devices include a button or touch screen on a video poker machine, a lever or handle connected to the gaming device, a magnetic stripe reader to read a player

tracking card inserted into a gaming device, a touch screen for input of player selections during game play, and a coin and bill acceptor 260.

The processor may also be in communication with a payment system, which may be a component of the gaming device. The payment system is a device capable of accepting payment from a player (*e.g.*, a bet or initiation of a balance) and / or providing payment to a player (*e.g.*, a payout). Payment is not limited to money, but may also include other types of consideration, including products, services, and alternate currencies. Exemplary methods of accepting payment by the payment system include (i) receiving hard currency (*i.e.*, coins or bills), and accordingly the payment system may comprise a coin or bill acceptor; (ii) receiving an alternate currency (*e.g.*, a paper cashless gaming voucher, a coupon, a non-negotiable token), and accordingly the payment system may comprise a bar code reader or other sensing means; (iii) receiving a payment identifier (*e.g.*, a credit card number, a debit card number, a player tracking card number) and debiting the account identified by the payment identifier; and (iv) determining that a player has performed a value-added activity (*e.g.*, participating in surveys, monitoring remote images for security purposes, referring friends to the casino).

The processor is in communication with a memory 270 and a communications port (*e.g.*, for communicating with one or more other devices). The memory may comprise an appropriate combination of magnetic, optical and/or semiconductor memory, and may include, for example, Random Access Memory (RAM), Read-Only Memory (ROM), a compact disc and/or a hard disk. The memory may comprise or include any type of computer-readable medium. The processor and the memory may each be, for example: (i) located entirely within a single computer or other device; or (ii) connected to each other by a remote communication medium, such as a serial port cable, telephone line or radio frequency transceiver. In one embodiment, the gaming device may comprise one or more devices that are connected to a remote server computer for maintaining databases.

The memory stores a program275 for controlling the processor. The processor performs instructions of the program, and thereby operates as disclosed herein, and particularly in accordance with the methods described in detail herein.

The program may be stored in a compressed, uncompiled and/or encrypted format. The program furthermore includes program elements that may be necessary, such as an operating system, a database management system and "device drivers" for allowing the processor to interface with computer peripheral devices. Appropriate program elements are known to those skilled in the art, and need not be described in detail herein.

The term "computer-readable medium" as used herein refers to any medium that participates in providing instructions to the processor of the gaming device (or any other processor of a device described herein) for execution. Such a medium may take many forms, including but not limited to, non-volatile media, volatile media, and transmission media. Non-volatile media include, for example, optical or magnetic disks, such as memory. Volatile media include dynamic random access memory (DRAM), which typically constitutes the main memory. Transmission media include coaxial cables, copper wire and fiber optics, including the wires that comprise a system bus coupled to the processor. Transmission media may carry acoustic or light waves, such as those generated during radio frequency (RF) and infrared (IR) data communications. Common forms of computer-readable media include, for example, a floppy disk, a flexible disk, hard disk, magnetic tape, any other magnetic medium, a CD-ROM, DVD, any other optical medium, punch cards, paper tape, any other physical medium with patterns of holes, a RAM, a PROM, an EPROM, a FLASH-EEPROM, any other memory chip or cartridge, a carrier wave as described hereinafter, or any other medium from which a computer can read.

Various forms of computer readable media may be involved in carrying one or more sequences of one or more instructions to the processor (or any other processor of a device described herein) for execution. For example, the instructions may initially be borne on a magnetic disk of a remote computer. The remote computer can load the instructions into its dynamic memory and send the instructions over a telephone line using a modem. A modem local to a gaming device (or, e.g., a server) can receive the data on the telephone line and use an infrared transmitter to convert the data to an infrared signal. An infrared detector can receive the data carried in the infrared signal and place the data on a system

bus for the processor. The system bus carries the data to main memory, from which the processor retrieves and executes the instructions. The instructions received by main memory may optionally be stored in memory either before or after execution by the processor. In addition, instructions may be received via a communication port as electrical, electromagnetic or optical signals, which are exemplary forms of carrier waves that carry data streams representing various types of information. Thus, the gaming device may obtain instructions in the form of a carrier wave.

According to an embodiment of the present invention, the instructions of the program may be read into a main memory from another computer-readable medium, such from a ROM. Execution of sequences of the instructions in program causes processor perform the process steps described herein. In alternate embodiments, hard-wired circuitry may be used in place of, or in combination with, software instructions for implementation of the processes described herein. Thus, embodiments of the present invention are not limited to any specific combination of hardware and software. As discussed with respect to aforementioned systems, execution of sequences of the instructions in a program of a peripheral device in communication with the gaming device may also cause the processor to perform some of the process steps described herein.

The memory may store one or more databases as would be apparent to one of skill in the art, including, for example, a probability database 280, a payout database 285. Some or all of the data stored in each database is described herein with reference to various embodiments. The data provides functionality to the processor when the data is processed according to various methods described herein.

The described entries of the databases represent exemplary information only; those skilled in the art will understand that the number and content of the entries can be different from those illustrated herein. Further, despite any description of the databases as tables, an object-based model could be used to store and manipulate the data types described herein and likewise, object methods or behaviors can be used to implement the processes described herein.

Where appropriate, a prior art probability database may be utilized in the performance of the inventive processes described herein. A probability database may be stored in the data storage device in tabular form, or any other appropriate database form, as is well known in the art. The data stored therein may include a number of exemplary records or entries, each defining a random number. Those skilled in the art will understand that the probability database may include any number of entries. The tabular representation may also define fields for each of the entries or records. The fields may specify: (i) a random number (or range of random numbers) that may be generated by the random number generator; and (ii) an outcome that indicates the one or more indicia comprising the outcome that corresponds to the random number of a particular record. A gaming device may utilize a probability database to determine, for example, what outcome corresponds to a random number generated by a random number generator and to display the determined outcome. The outcomes may comprise the three symbols to be displayed along the payline of a three-reel slot machine. Other arrangements of probability databases are possible. For example, the book "Winning At Slot Machines" by Jim Regan (Carol Publishing Group Edition, 1997) illustrates many examples of payout and probability tables and how they may be derived. The entirety of this book is incorporated by reference herein.

Further, where appropriate, a prior art payout database may be utilized in the performance of the inventive processes described herein. A payout database may be stored in the data storage device in tabular form, or any other appropriate database form, as is well known in the art. The data stored therein includes a number of example records or entries, each defining an outcome that may be obtained on a gaming device that corresponds to a payout. Those skilled in the art will understand that the payout database may include any number of entries. The tabular representation also defines fields for each of the entries or records. The fields specify: (i) an outcome, which indicates the one or more indicia comprising a given outcome; and (ii) a payout that corresponds to each respective outcome. The outcomes may be those obtained on a three reel slot machine.

A gaming device may utilize the payout database to determine whether a payout should be output to a player as a result of an outcome obtained for a game.

For example, after determining the outcome to output on the gaming device, the gaming device may access the payout database to determine whether the outcome for output is one of the outcomes stored as corresponding to a payout. If it is, the gaming device may provide the corresponding payout to the player.

Other arrangements of payout databases are possible. For example, the book "Winning At Slot Machines" by Jim Regan (Carol Publishing Group Edition, 1997) illustrates many examples of payout and probability tables and how they may be derived.

Additionally, where appropriate, a player tracking database may be utilized to store historical data associated with specific players. A player tracking database may be used, for example, to store player wager data so that players wagering over a given threshold in a given amount of time may be rewarded for their patronage. The player tracking database may also contain other information that may be useful in, for example, promoting and managing player behaviors (*e.g.*, information about the player's outstanding debts, lodging arrangements, and the like). Further, the player tracking database may store data regarding a given player's standing in a game session or meta game, so that the player can continue the game session or meta game at a plurality of game machines that have common access to the player tracking database. Such player tracking data may be stored in a relational database and retrieved or otherwise accessed by the processor after receiving a "key" data point from the player, such as a unique identifier read from the player's player tracking card.

Note that, although these databases may be described as being stored in a gaming device, in other embodiments some or all of these databases may be partially or wholly stored in another device, such as one or more of the peripheral devices, the peripheral device server and / or the server computer. Further, some or all of the data described as being stored in the databases may be partially or wholly stored (in addition to or in lieu of being stored in the memory of the gaming device) in a memory of one or more other devices, such as one or more of the peripheral devices, another gaming device, the peripheral device server and / or the computer.

As discussed herein, in one or more embodiments the game device may take the form of a slot machine configured to operate in conjunction as described herein. A more specific description of a suitable slot machine follows.

A slot machine may comprise, for example, a three-reel or five-reel slot machine as is known in the art. The slot machine comprises a display area in which an outcome for a game of the slot machine is displayed to the player. The display area may, for example, be a video display that displays graphical representations of reels. The display area may, in another example, be glass behind which are located mechanical reels. Within the display area is a payline.

In accordance with one or more embodiments of the present invention, an outcome of a game is a set of symbols displayed along a payline of a reeled slot machine. Referring to FIG. 3, three reels 350, 360 and 370 each include a plurality of symbols. One payline intersects one symbol on each reel. Thus, a payline in such an embodiment yields three symbols 300, which can constitute an outcome according to various embodiments of the invention.

The slot machine may further comprise a handle. A player may initiate the movement of the reels in the display area by pulling on the handle. Alternatively, a player may initiate the movement of the reels in the display area by actuating a start button. Either or both of the handle and start button are exemplary embodiments of the input device, described herein.

Where appropriate or desirable, the slot machine may also include an alternate, secondary game screen, for outputting information to a player. The secondary game screen may be utilized, for example, to inform a player of the player's standing in a meta-game.

The slot machine may also include a payment system, which is comprised of a bill acceptor, a credit card reader, and a coin acceptor. A player may utilize payment system to provide a wager for playing a game and or for providing payment for provision of an outcome.

The slot machine may further comprise a credit meter balance, which is an exemplary embodiment of a benefit output device that was described herein. The credit meter balance reflects the amount of electronic credits currently available to a player. The electronic credits may be used by a player, for example, as wagers

for games played on the gaming device. The electronic credits may also be "cashed out" as coins, bills, tokens, a cashless gaming receipt, and / or credits to another financial account associated with the player.

Finally, the slot machine may comprise a coin tray. Payment to the player may be rendered by dispensing coins into the coin tray. Such coins may be dispensed based on, for example, a player's indication that the player would like to cash out his credit meter balance and / or a payout obtained by a player as a result of playing a game on the slot machine. The coin tray is an exemplary embodiment of the benefit output device, described herein. Note that, where appropriate, the slot machine may include different and / or additional components besides those discussed in this section.

Following is a description of process steps to be performed by (i) a gaming device, (ii) a controller, (iii) devices operatively connected to gaming devices and/or controllers (e.g. retrofitted hardware devices), and (iv) any combination thereof. Thus, although the following description discusses the steps as performed by a gaming device, it contemplated that the steps may be performed by any combination of the devices and computers (e.g., a central server) described herein.

Step 1: Initiate game

A game device first receives a request to initiate a game by receiving a signal via an input device, such as a touch screen button. Alternatively, such a request may be received via a payment accepting apparatus, for example upon the deposit of currency, a credit card, or the like. Further, such a request may be received via a device configured to accept and read player tracking cards, as is known in the art.

A game that may be initiated may constitute a basic game and/or a meta-game. Further, a player may purchase a single handle pull or a prepaid session. Thus, a player may initiate play of a basic game and a meta-game through the purchase of a single handle pull, in which case additional symbols for use in the meta-game could be collected through the purchase of additional handle pulls. Or, a player may initiate play of both a basic game and a meta-game through the

purchase of a prepaid session, in which case individual outcomes may yield payouts, and aggregated symbols may be collected (through placement of such symbols in a display matrix) throughout the session and be used to determine bonus payout eligibility. Further, a player may initiate play of a meta-game through the purchase of a prepaid session, in which case a basic game may not be simultaneously initiated (i.e. only a bonus payout can be awarded through a combination of aggregated symbols).

A subroutine may optionally be employed at this juncture for confirming the player's desire to play a game or meta-game. For example, a confirmation screen may be shown to the player via a display device which prompts the player to (i) view or listen to instructional material, (ii) acknowledge the rules of a game or meta-game, (iii) accept the terms of a contractual offer, or (iv) any combination thereof. Such a confirmation subroutine may be particularly desirable in meta-game embodiments employing prepaid session functionality. A more detailed description of systems and methods for providing a confirmation screen to a player are disclosed in Applicant's U. S. Patent Application Serial Number 60/451,973, entitled METHOD AND APPARATUS FOR MANAGING GAME CONFIRMATIONS, filed March 4, 2003, the entirety of which is incorporated by reference herein.

Step 2: Determine outcome(s)

Once a game is initiated, the game device randomly determines an outcome or plurality of outcomes, as described herein. For example, a single outcome may result from a handle pull, or a plurality of outcomes may result upon the initiation of a prepaid session, such as, for example, in an embodiment where a prepaid session initiates a popcorn-themed meta-game whereby a plurality of outcomes are determined.

In some embodiments, determination of an outcome or outcomes at this step can be accompanied by a determination of payout eligibility. For example, in an embodiment where a prepaid session initiates a popcorn-themed meta-game comprising a plurality of outcomes, each individual outcome may potentially yield a payout, or in a basic game a handle pull may result in a payout.

Step 3: Determine symbol(s) corresponding to outcome(s)

Symbols corresponding to the outcomes are determined. As described herein, outcomes may be associated with (i) individual symbols that independently can be used to determine payout eligibility (e.g. a single cherry symbol outcome yields a payout), and/or (ii) a plurality of individual symbols that are used to determine payout or bonus payout eligibility (e.g. a cherry-cherry-cherry outcome in a basic slot machine game, or the aggregation of 3 cherries in a meta-game). For example, in various embodiments described herein, a single outcome may correspond to a single symbol. In another embodiment, a single outcome may correspond to multiple symbols.

Various steps may be combined. For example, in some embodiments Steps 2 and 3 may be combined so that determination of a random outcome directly determines a symbol. For example, rather than utilizing a random number generator to determine a random number which is in turn used to determine a corresponding symbol in a relational database, the randomization may simply yield a selection of one (or more) of several symbols.

Step 4: Determine position(s) on display matrix corresponding to symbol(s)

Once symbols are determined, a determination is made as to where to position such symbols in a display matrix. In one embodiment, this determination is made randomly.

In another embodiment, this determination is made based on rules that consider the position of previously-accumulated symbols. For example, stored rules (e.g., which are retrievable by the processor from a data storage device) may dictate that: (1) subsequently generated symbols cannot replace previously generated symbols in a display matrix; (2) unless occupied by other previously generated symbols, symbols should be placed in the row position closest to similar, previously-generated symbols in the display matrix (e.g. cherry symbols should be placed as close as possible to other cherry symbols, and in the same row of the matrix); and/or (3) symbols should be situated in the matrix so as to provide the

player with the maximum payout (i.e. symbols should be combined according to stored rules in a way that maximizes payouts).

In the third embodiment, this determination is made based on a previous determination of a multi-symbol outcome. In this embodiment, a multi-symbol outcome (e.g. "cherry-bar-plum") is initially determined in Steps 2 and/or 3. Then, in this step of the process (Step 4), the originally determined multi-symbol outcome configuration is retrieved from memory so that the system can determine where in the display matrix to visually place the individual components of the multi-symbol outcome.

Step 5: Output symbol(s) to player via display device

The determined symbols are then output to the player via the display device. In the first and second embodiments, the outcomes appear along with popcorn icons. That is, a popcorn icon may be replaced by or transformed into an outcome, as represented on the game display. Or, a symbol may be superimposed over or otherwise accompany a popcorn icon.

In the third embodiment, the individual components of the multi-symbol outcome are each displayed to the player so that the player cannot initially determine the ultimate relative position of the individual component outcome symbols. For example, the individual symbols may be serially revealed to the player. Or, they may be simultaneously displayed in a scrambled fashion. Here too, popcorn icons may be communicated to the player via a display device, and such popcorn icons may be replaced by or transformed into an outcome. Or, a symbol may be superimposed over or otherwise accompany a popcorn icon.

It should be noted that, alternatively, the determination of a symbol's position on a display matrix (Step 4) may follow the step of outputting a symbol or symbols to the player (Step 5).

Step 6: Transfer symbol(s) representing first outcome to determined position on display matrix

In a manner known in the art, the symbols may be transferred to the determined position on the display matrix. Various methods for communicating

the movement of icons on a display device are well known and need not be described in detail herein.

Step 7: Determine bonus payout eligibility based on relative position of at least two symbols

Once at least two symbols are placed in the display matrix, a determination is made as to bonus payout eligibility. To determine bonus payout eligibility, a stored set of rules may be retrieved from a database or otherwise referenced from a memory. Such stored rules may indicate the various payouts that are to be awarded to the player for the various combinations of the various symbols that were placed in the display matrix previously. For example, stored rules may indicate that: (1) three pear symbols occurring in a single row of a display matrix yields two points, (2) three cherry symbols occurring on a single row of a display matrix yields three points, (3) a diagonal line of three cherry symbols occurring anywhere on the display matrix yields five points, and (4) a total of 50 points in a game session qualifies the player for a $200 bonus payout. Alternatively, individual combinations of symbols may directly yield bonus payouts. For example, three cherry symbols occurring on a single row may yield a bonus payout of $5.

Once payout eligibility is determined, a payout may be actuated at the gaming device in a manner known in the art. For example, an appropriate amount of coins may be dispensed into a coin tray.

In some embodiments, a scrolling matrix may be employed, and may optionally be communicated to the player as a "conveyor belt". A scrolling matrix would function to institute a time limit associated with accumulated outcomes, such that if a given row of a matrix is not filled by the necessary complementary symbols by the time the row disappears from the screen, the player would lose any accumulated symbols in that row. The expiration of aggregated symbols in a meta-game is explained in detail in Applicant's (I) U.S. Patent Application Serial Number [NOT YET ASSIGNED] (Attorney Docket No. 03-008), entitled "Electronic Amusement Device and Method for Enhanced Slot Machine Play",

filed February 5, 2004, (II) U.S. Patent Application Serial Number [NOT YET ASSIGNED] (Attorney Docket No. 03-008A), entitled "METHOD AND APPARATUS FOR ENHANCED PLAY OF A GAMING DEVICE", filed February 13, 2004, and (III) co-pending U.S. Patent Application Serial Number 09/716,918, entitled "Electronic Amusement Device and Method for Enhanced Slot Machine Play", filed November 20, 2000, which is a continuation in part of U.S. Patent Application Serial Number 09/164473, entitled "Electronic Amusement Device and Method for Enhancing Slot Machine Play", filed October 1, 1998, and issued on March 20, 2001 as U.S. Patent No. 6,203,430. The entirety of each of the above applications and patents is incorporated herein by reference.

In some embodiments, two game screens may be employed so that a first game screen is used to initially display symbols and icons, and the second game screen is used for a display matrix. For example, after popcorn icons and/or game symbols are revealed on a first game screen, the icons and/or symbols may migrate to a separate game screen for placement in the display matrix.

In some embodiments, a peripheral device may be operatively connected to a gaming device that is configured to assist in the operation of functions related to basic games and/or meta-games. A peripheral device may include a processor that can communicate with a processor of a gaming device. Further, a peripheral device may have one or more output deices, such as display screens, and one or more input devices, such as buttons. Examples of peripheral devices include (1) electronic apparatuses "retrofitted" to conventional gaming devices so that inventive processes disclosed herein may be realized through game play at such gaming devices, (2) Personal Digital Assistants (PDAs) such as those manufactured by Palm, Inc., (3) lap top computers, (4) cellular telephones, (5) pagers, or (6) any combination thereof.